UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
WACO DIVISION

PARKERVISION, INC., Plaintiff, **v.** **INTEL CORPORATION,** Defendant.	**Case No. 6:20-cv-00562-ADA** **JURY TRIAL DEMANDED**

SECOND AMENDED COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff ParkerVision, Inc. ("ParkerVision"), by and through its undersigned counsel, files this Amended Complaint against Defendant Intel Corporation ("Intel") for patent infringement of United States Patent Nos. 6,049,706, 7,050,508 and 8,190,108 ("the patents-in-suit") and alleges as follows:

NATURE OF THE ACTION

1. This is an action for patent infringement arising under the patent laws of the United States, 35 U.S.C. §§ 1 *et seq*.

PARTIES

2. Plaintiff ParkerVision is a Florida corporation with its principal place of business at 4446-1A Hendricks Avenue, Suite 354, Jacksonville, Florida 32207.

3. On information and belief, Defendant Intel is a Delaware corporation with a place of business at 2200 Mission College Boulevard, Santa Clara, California 95054.

4. On information and belief, Intel has places of business in this judicial district: 1300 S. Mopac Expressway, Austin, Texas 78746; 6500 River Place Blvd, Bldg. 7, Austin, Texas 78730 and 5113 Southwest Parkway, Austin, Texas 78735 (collectively, "Austin Offices"). https://www.intel.com/content/www/us/en/location/usa.html.

5. Intel can be served with process through its registered agent for service in Texas: CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, Texas 75201.

6. On information and belief, since at least April 1989, Intel has been registered to do business in the State of Texas under Texas Taxpayer Number 19416727436.

JURISDICTION AND VENUE

7. This Court has subject matter jurisdiction over this action pursuant to 28 U.S.C. §§ 1331 and 1338(a) because this action arises under the patent laws of the United States, 35 U.S.C. §§ 1 *et seq*.

8. Intel is subject to this Court's personal jurisdiction in accordance with due process and/or the Texas Long Arm Statute because, in part, Intel "[r]ecruits Texas residents, directly or through an intermediary located in this state, for employment inside or outside this state." *See* Tex. Civ. Prac. & Rem. Code § 17.042.

9. This Court has personal jurisdiction over Intel because Intel (directly and/or through its subsidiaries, affiliates, or intermediaries) has committed and continues to commit acts of infringement in this judicial district in violation of at least 35 U.S.C. § 271(a).

10. This Court also has personal jurisdiction over Intel because Intel has

sufficient minimum contacts with this forum as a result of business conducted within the State of Texas and this judicial district. In particular, this Court has personal jurisdiction over Intel because, *inter alia*, Intel, on information and belief: (1) has substantial, continuous, and systematic business contacts with this State and this judicial district; (2) owns, manages, and/or operates facilities in this State and this judicial district; (3) enjoys substantial income from its operations in this State and this judicial district; (4) employs Texas residents in this State and this judicial district; and (5) solicits business and markets infringing products in this State and this judicial district.

11. Intel has purposefully availed itself of the privileges of conducting business within this judicial district, has established sufficient minimum contacts with this judicial district such that it should reasonably and fairly anticipate being hauled into court in this judicial district, has purposefully directed activities at residents of thisjudicial district, and at least a portion of the patent infringement claims alleged in this Complaint arise out of or are related to one or more of the foregoing activities.

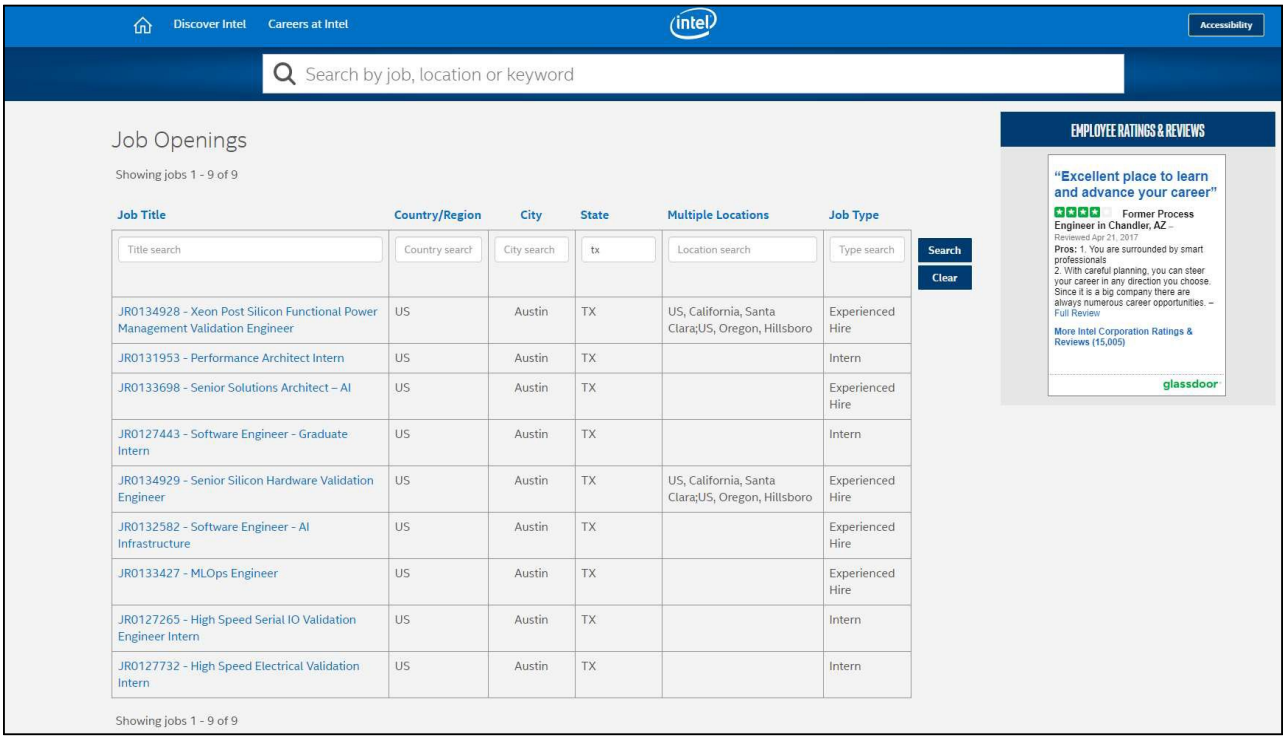
12. Venue is proper in this judicial district pursuant to 28 U.S.C. § § 1391(b)-(d) and/or 1400(b). Intel is registered to do business in the State of Texas, maintains a regular and established place of business within this judicial district, and has committedacts of infringement in this judicial district.

13. On information and belief, Intel maintains a significant physical presence in this judicial district.

14. On information and belief, Intel uses its Austin Offices as a regular and established place of business. On information and belief, Intel has employed over 1700 employees in the Austin area. https://www.linkedin.com/company/intel-corporation/people/?facetGeoRegion=us%3A64.

15. Intel describes its operations in Austin on its website: "Located in the capitol city of Texas, Intel Austin is an important research and development center for the Intel technology that is changing the way we live, work, and play. Among the innovations developed in Austin are core technologies for next-generation microprocessors, platforms and base software; groundbreaking silicon solutions for computing and communications devices, which include handheld computing and cellular communications; and cutting-edge network storage products." https://www.intel.com/content/www/us/en/jobs/locations/united-states/sites/austin.html.

16. On information and belief, Intel has hundreds of H-1B labor condition applications for people employed in Austin, Texas. https://h1bsalary.online/index.php?searchtext=INTEL+CORPORATION&year=&minsalary=&state=&worksite_city=AUSTIN&job_title=. Employees holding an H-1B visa are employed in a specialty occupation that requires "theoretical and practical application of a body of highly specialized knowledge . . . and attainment of a bachelor's or higher degree in the specific specialty." *See generally* 8 U.S.C. § 1184. As such, Intel employees in Austin, Texas are highly specialized and important to the operation of Intel.



https://jobs.intel.com/ListJobs/All/Search/state/tx/ (last visited on June 10, 2020).

17. Intel lists job openings on its website for positions in Austin, Texas.

18. On information and belief, Intel has litigated/is litigating cases before this Court in which it admitted that venue was proper, did not contest personal jurisdiction, and/or filed counterclaims. *See, e.g.*, *Flash-Control, LLC v. Intel Corp.*, Case No. 1:19-cv-01107 (W.D. Tex.); *VLSI Tech. LLC v. Intel Corp.*, Case No. 1:19-cv-00977 (W.D. Tex.).

BACKGROUND

19. In 1989, Jeff Parker and David Sorrells started ParkerVision in Jacksonville, Florida. Through the mid-1990s, ParkerVision focused on developing commercial video cameras, e.g., for television broadcasts. The cameras used radio frequency (RF) technology to automatically track the camera's subject.

20. When developing consumer video cameras, however, ParkerVision encountered a problem – the power and battery requirements for RF communications made a cost effective, consumer-sized product impractical. So, Mr. Sorrells and ParkerVision's engineering team began researching ways to solve this problem.

21. At the time, a decade's-old RF technology called super-heterodyne dominated the consumer products industry. But this technology was not without its own problems – the circuity was large and required significant power.

22. From 1995 through 1998, ParkerVision engineers developed an innovative method of RF direct conversion by a process of sampling a RF carrier signal and transferring energy to create a down-converted baseband signal.

23. After developing prototype chips and conducting tests, ParkerVision soonrealized that its technology led to improved RF receiver performance, lower power consumption, reduced size and integration benefits. In other words, RF receivers could be built smaller, cheaper, and with better performance.

24. ParkerVision's innovations did not stop there. ParkerVision went on to develop additional RF down-conversion technologies, RF up-conversion technologies and other related direct-conversion technologies. Similar to its down-conversion technology, ParkerVision's up-conversion technology provided size and integration benefits, improved performance, lower costs and power savings. ParkerVision also developed complementary wireless communications technologies involving interactions, processes, and controls between the baseband processor and the transceiver, which improved and enhanced the operation of transceivers that

incorporated ParkerVision's down-conversion and up-conversion technologies. To date, ParkerVision has been granted over 200 patents related to its innovations including, the patents-in-suit.

25. ParkerVision's technology helped make today's mobile devices, such as smart phones and tablets, a reality by enabling RF chips used in these devices to be smaller, cheaper, more efficient, and with higher performance.

INTEL CHIPS

26. Upon information and belief, Intel (or those acting on its behalf) made, used, sold, offered to sell and/or imported receiver, transmitter, and/or transceiver integrated circuits, for example, for use in cellular devices such as smartphones. These chips include, without limitation, the Intel PMB 5750, PMB 5757 and PMB 5762 ("PMB Chips") and any other receiver, transmitter, and/or transceiver integrated circuits (1) which have down-conversion circuitry configured the same as or equivalent to any of the PMB Chips and (2) are used (or intended for use in) and/or contained in cellular devices, near field communication devices, smart watches, personal area networks, cable modems, smart meters, DSL modems, Bluetooth devices and/or Wi-Fi devices. The receiver, transmitter, and/or transceiver integrated circuits referenced in this paragraph shall each be referred to as an "Intel Chip" or collectively the "Intel Chips."

27. Some of the Intel Chips, specifically the PMB Chips, provide cellular connectivity for devices such as Apple iPhones.

28. On information and belief, the PMB5750 was incorporated into devices including, without limitation, the Apple iPhone 7 and 7 Plus.[1] On information and belief, the PMB5757 was incorporated into devices including, without limitation, the Apple iPhone 8, 8 Plus and X.[2] On information and belief, the PMB5762 was incorporated into devices including, without limitation, the Apple iPhone XR, XS and XS Max.[3]

29. On February 7, 2017, Intel published a paper entitled "A Digital Multimode Polar Transmitter Supporting 40MHz LTE Carrier Aggregation in 28nm CMOS," describing digital polar transmitter architecture with a die micrograph of the DPLL and AM path of the transmitter (shown below).[4] On information and belief, the die micrograph (below) illustrates Intel's PMB5750 chip.

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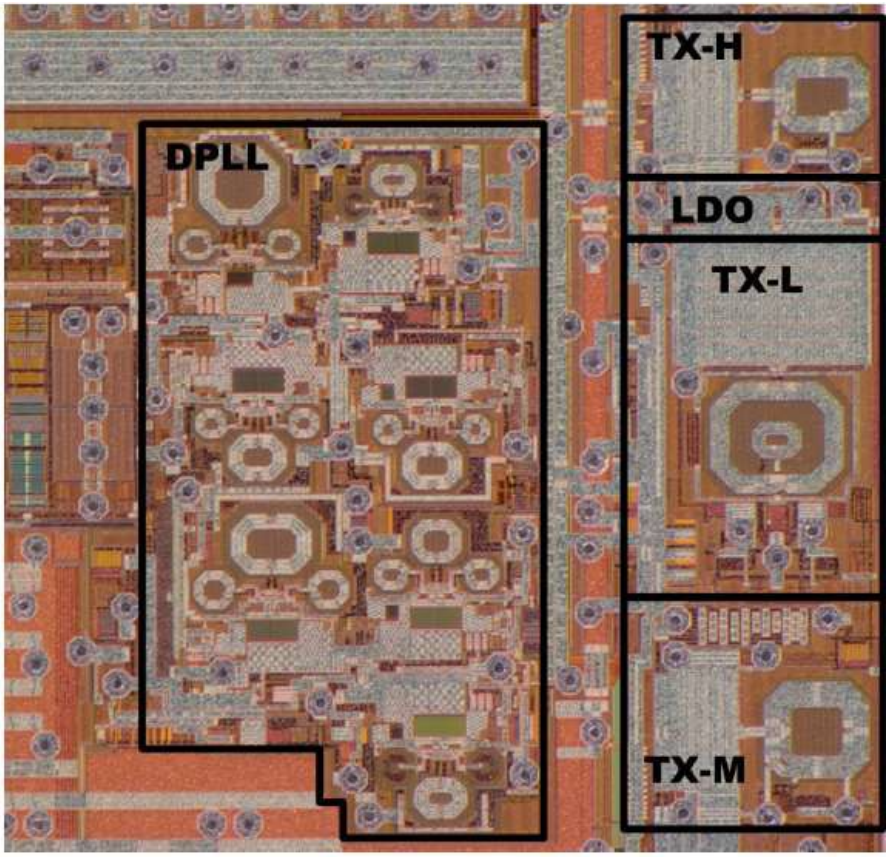
[1] *See* Wegner et al., *Apple iPhone 7 Teardown*, TechInsights (Sept. 15, 2016), https://techinsights.com/blog/apple-iphone-7-teardown; *see also* Srivatsan Sridhar, *Apple iPhone 7 and 7 Plus teardown confirms bigger battery, Intel LTE modem in some models and more*, FoneArena (Sept. 16, 2016), https://www.fonearena.com/blog/197580/apple-iphone-7-and-7-plus-teardown-confirms-bigger-battery-intel-lte-modem-in-some-models-and-more.html.

[2] *See* Yang et al., *Apple iPhone X Teardown*, TechInsights (last modified Nov. 8, 2017), https://www.techinsights.com/blog/apple-iphone-x-teardown.

[3] *See iPhone XS and XS Max Teardown*, iFixit (Sept. 21, 2018), *https*://www.ifixit.com/Teardown/iPhone+XS+and+XS+Max+Teardown/113021; *iPhone XR Teardown*, iFixit (Oct. 26, 2018), https://www.ifixit.com/Teardown/iPhone+XR+Teardown/114123.

[4] M. Fulde et al., "A Digital Multimode Polar Transmitter Supporting 40MHz LTE Carrier Aggregation in 28nm CMOS," ISSCC, pp. 218-219 (Feb. 2017).



30. On information and belief, the structure, function, and operation of Intel'sPMB5757 and PMB5762 chips are substantially similar to the PMB5750 with respect to the features claimed in the patents-in-suit.

31. On information and belief, in December 2019, Apple acquired Intel's smartphone modem business for $1 billion. https://www.engadget.com/2019-12-02-apple-owns-intel-modem-business.html.

THE ASSERTED PATENTS

United States Patent No. 6,049,706

32. On April 11, 2000, the United States Patent and Trademark Office duly and legally issued United States Patent No. 6,049,706 ("the '706 patent") entitled "Integrated Frequency Translation and Selectivity" to inventor Robert W. Cook et al.

33. The ’706 patent is presumed valid under 35 U.S.C. § 282.

34. ParkerVision owns all rights, title, and interest in the ’706 patent.

United States Patent No. 7,050,508

35. On May 23, 2006, the United States Patent and Trademark Office duly andlegally issued United States Patent No. 7,050,508 (“the ’508 patent”) entitled “Method and System for Frequency Up-Conversion with a Variety of Transmitter Configurations” to inventor David F. Sorrells et al.

36. The ’508 patent is presumed valid under 35 U.S.C. § 282.

37. ParkerVision owns all rights, title, and interest in the ’508 patent.

United States Patent No. 8,190,108

38. On May 29, 2012, the United States Patent and Trademark Office duly andlegally issued United States Patent No. 8,190,108 (“the ’108 patent”) entitled “Method and System for Frequency Up-Conversion” to inventor David F. Sorrells et al.

39. The ’108 patent is presumed valid under 35 U.S.C. § 282.

40. ParkerVision owns all rights, title, and interest in the ’108 patent.

CLAIMS FOR RELIEF

COUNT I - Infringement of United States Patent No. 6,049,706

41. The allegations set forth above are re-alleged and incorporated by reference as if they were set forth fully here.

42. Intel directly infringes (literally and/or under the doctrine of equivalents) the ’706 patent by making, using, selling, offering for sale, and/or importing into the

United States products covered by at least claim 1 of the '706 patent.

43. Intel products that infringe one or more claims of the '706 patent include, but are not limited to, the Intel Chips, and any other Intel device that is capable of filtering and down-converting a higher-frequency signal to a lower-frequency signal as claimed in the '706 patent. On information and belief, Intel uses the Intel Chips at least by testing the Intel Chips in the United States.

44. Each Intel Chip is/includes an apparatus for filtering and down-converting (e.g., a higher frequency RF signal to a lower frequency signal). Each Intel Chip includes a frequency translator, comprising a down-convert and delay module to under-sample an input signal (e.g., high frequency RF signal) to produce an input sample of a down-converted image of said input signal, and to delay said input sample.Each Intel Chip also includes a filter, comprising at least a portion of said down-convertand delay module, at least one delay module to delay instances of an output signal, andan adder (e.g., operational amplifier with parallel resistor-capacitor feedback) to combine at least said delayed input sample with at least one of said delayed instances ofsaid output signal to generate an instance of said output signal.

45. The down-convert and delay module under-samples (e.g., at a sample ratebelow the Nyquist rate) said input signal according to a control signal (e.g., local oscillator (LO) signal), wherein a frequency of said control signal is equal to a frequencyof said input signal plus or minus a frequency of said down-converted image, divided by n, where n represents a harmonic or sub-harmonic of said input signal.

46. ParkerVision has been damaged by the direct infringement of Intel and is suffering and will continue to suffer irreparable harm and damages as a result of this infringement.

COUNT II - Infringement of United States Patent No. 7,050,508

47. The allegations set forth above are re-alleged and incorporated by reference as if they were set forth fully here.

48. Intel directly infringes (literally and/or under the doctrine of equivalents)the '508 patent by making, using, selling, offering for sale, and/or importing into the United States products covered by at least claim 3 of the '508 patent.

49. Intel products that infringe one or more claims of the '508 patent include, but are not limited to, the Intel Chips, and any other Intel device that is capable of up-converting a lower-frequency signal to a higher-frequency signal as claimed in the '508 patent. On information and belief, Intel uses the Intel Chips at least by testing the Intel Chips in the United States.

50. Each Intel Chip is/includes an apparatus for frequency up-conversion. Each Intel Chip includes a pulse shaping means (e.g., logic devices) for shaping a string of pulses from a reference signal (e.g., local oscillator (LO) signal); aperture generation means (e.g., digital phase locked loop) coupled to said pulse shaping means for generating a string of multiple pulses from said string of pulses; and gating means (e.g., inverter) for gating a bias signal (e.g., a signal having a steady, predetermined level) under the control of said string of multiple pulses to generate a periodic signal having a plurality of harmonics at least one of which is at a desired

frequency.

51. On information and belief, the aperture generation means of each Intel Chip includes input means for receiving said string of pulses; logic gating means for outputting said string of pulses; and first delaying means for delaying said string of pulses for a first period of time.

52. ParkerVision has been damaged by the direct infringement of Intel and is suffering and will continue to suffer irreparable harm and damages as a result of this infringement.

COUNT III – Infringement of United States Patent No. 8,190,108

53. The allegations set forth above are re-alleged and incorporated by reference as if they were set forth fully here.

54. Intel directly infringes (literally and/or under the doctrine of equivalents)the '108 patent by making, using, selling, offering for sale, and/or importing into the United States products covered by at least claim 8 of the '108 patent.

55. Intel products that infringe one or more claims of the '108 patent include, but are not limited to, the Intel Chips, and any other Intel device that is capable of up-converting a lower-frequency signal to a higher-frequency signal as claimed in the '108 patent. On information and belief, Intel uses the Intel Chips at least by testing the Intel Chips in the United States.

56. Each Intel Chip is/includes a frequency conversion module having a first switch (e.g., transistor) configured to up-convert a signal (e.g., baseband signal) based

on a control signal (e.g., modulated oscillating signal) and a bias signal (e.g., a signal having a steady, predetermined level), wherein said signal are routed to said frequencyconversion module via a second switch (e.g., transistor), and wherein said signal is transmitted by an antenna connected to a third switch (e.g., transistor).

57. Each Intel Chip has a pulse shaper (e.g., digital phase locked loop); and anoscillating signal generator (e.g., LO). The oscillating signal generator includes a voltage controlled oscillator configured to generate an oscillating signal (e.g., LO signal), and the pulse shaper is configured to generate a string of pulses based on the oscillating signal.

58. ParkerVision has been damaged by the direct infringement of Intel, and issuffering and will continue to suffer irreparable harm and damages as a result of this infringement.

JURY DEMANDED

Pursuant to Rule 38(b) of the Federal Rules of Civil Procedure, ParkerVision hereby requests a trial by jury on all issues so triable.

PRAYER FOR RELIEF

WHEREFORE, ParkerVision respectfully requests that the Court enter judgment in its favor and against Intel as follows:

a. finding that Intel directly infringes one or more claims of each of the patents-in-suit;

b. awarding ParkerVision damages under 35 U.S.C. § 284, or otherwise permitted by law, including supplemental damages for any continued

post-verdict infringement;

c. awarding ParkerVision pre-judgment and post-judgment interest on the damages award and costs;

d. awarding cost of this action (including all disbursements) and attorney fees pursuant to 35 U.S.C. § 285, or as otherwise permitted by the law; and

e. awarding such other costs and further relief that the Court determines to be just and equitable.

Dated: May 28, 2021

Respectfully submitted,

/s/Raymond W. Mort, III

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** Not admitted to practice in Virginia*